

***Vaejovis spicatus*: A New Scorpion from California**

(Scorpionida: Vaejovidae)

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Described below is a new vaejovid scorpion species, discovered in the Little San Bernardino Mountains of southern California. A remarkably developed subaculear protuberance on the telson of this species suggests the name.

***Vaejovis spicatus* Haradon, new species**

(Figs. 1-7)

DIAGNOSIS.—Males unknown. Females of *V. spicatus* are distinguishable from all other known species of *Vaejovis* by the presence of an elongate subaculear "tooth" (Figs. 4, 5). Females somewhat similar to those of *Vaejovis joshuaensis* Soleglad (1972, p. 190), also from southern California, but differ as follows: (1) fixed pedipalp finger about equal to or slightly shorter (not distinctly longer) than manus; (2) six and seven interior lateral granules on fixed and movable pedipalp fingers respectively (do not vary on each finger from four to six); (3) metasomal segment V width greater than (not about equal to) half its length, and greater (not less) than width of segment I; (4) bristles along dorsal keels of metasomal segments I-IV, 0, 1, 1, 2 (not 0, 0, 1, 1); (5) total adult length about 17 mm (not 24 mm).

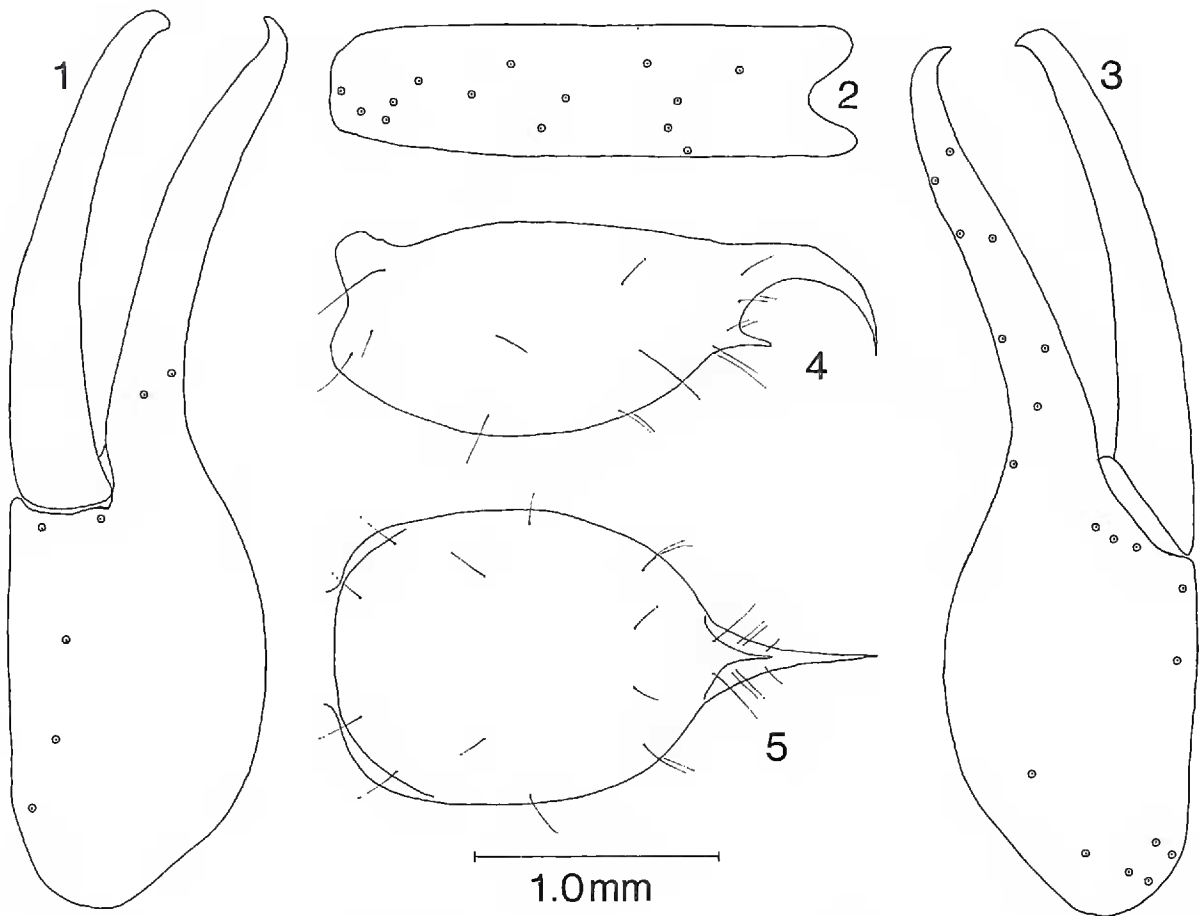
DESCRIPTION OF HOLOTYPE (ADULT FEMALE).—*Size*.—Measurements given in Table 1.

*Coloration*.—Ground color brownish-yellow, fingers slightly darker; no contrasting markings. Granules along carinae usually reddish-brown. Tip of aculeus red.

*Carapace*.—Anterior margin concave, with slight median notch. Entire surface finely granular. Median furrows narrow, shallow; posterior laterals broad, very shallow; all other furrows and associated keels obsolete. At least two pairs of lateral eyes, third indefinite. Median ocular tubercle set in shallow depression, forward of center; posterior carapace length/carapace length = 0.65.

*Chelicerae*.—Superior margin of fixed digit with basal bicuspid, single adjacent tooth, and terminating in single tine; inferior margin smooth. Movable digit bifurcate distally, superior tine about  $\frac{1}{2}$  length of inferior; superior margin with two small subapical teeth, adjacent larger tooth, and fourth small, basal; serrula along smooth inferior margin, not extending to apex. Long white hairs along inferior and interior basal surfaces of fixed digit. Single dorsal bristle just posterior to digital commissure.

*Pedipalps*.—Sparsely hirsute. Interior keels of humerus and brachium distinct and granular; exterior dorsal keels weak, lightly granular. Intercarinal areas uniformly finely granular. Chelae relatively slender; manus contour somewhat rounded; all keels weakly developed; digital smooth, inner secondary very lightly granular, interior marginal vestigial. Movable digit distinctly longer than manus; interior margins with closely set, pointed denticles in seven (movable digit) and



FIGS. 1-5. *Vaejovis spicatus* Haradon, new species. Holotype female. 1. Right chela, trichobothria ventral-exterior surfaces. 2. Right brachium, trichobothria exterior surface. 3. Right chela, trichobothria dorsal surface. 4. Telson, lateral view. 5. Telson, ventral view.

six (fixed digit) rows, each row marked distally by enlarged denticle and adjacent interior lateral granule; slight even space between closed fingers. Trichobothria: humerus, one each proximally on interior, dorsal and exterior surfaces; brachium, two ventral, one interior, two dorsal, 14 exterior (Fig. 2); chela, two on interior base of fixed digit, five on exterior surface of manus (Fig. 1), 19 on fixed digit and manus viewed dorsally (Fig. 3).

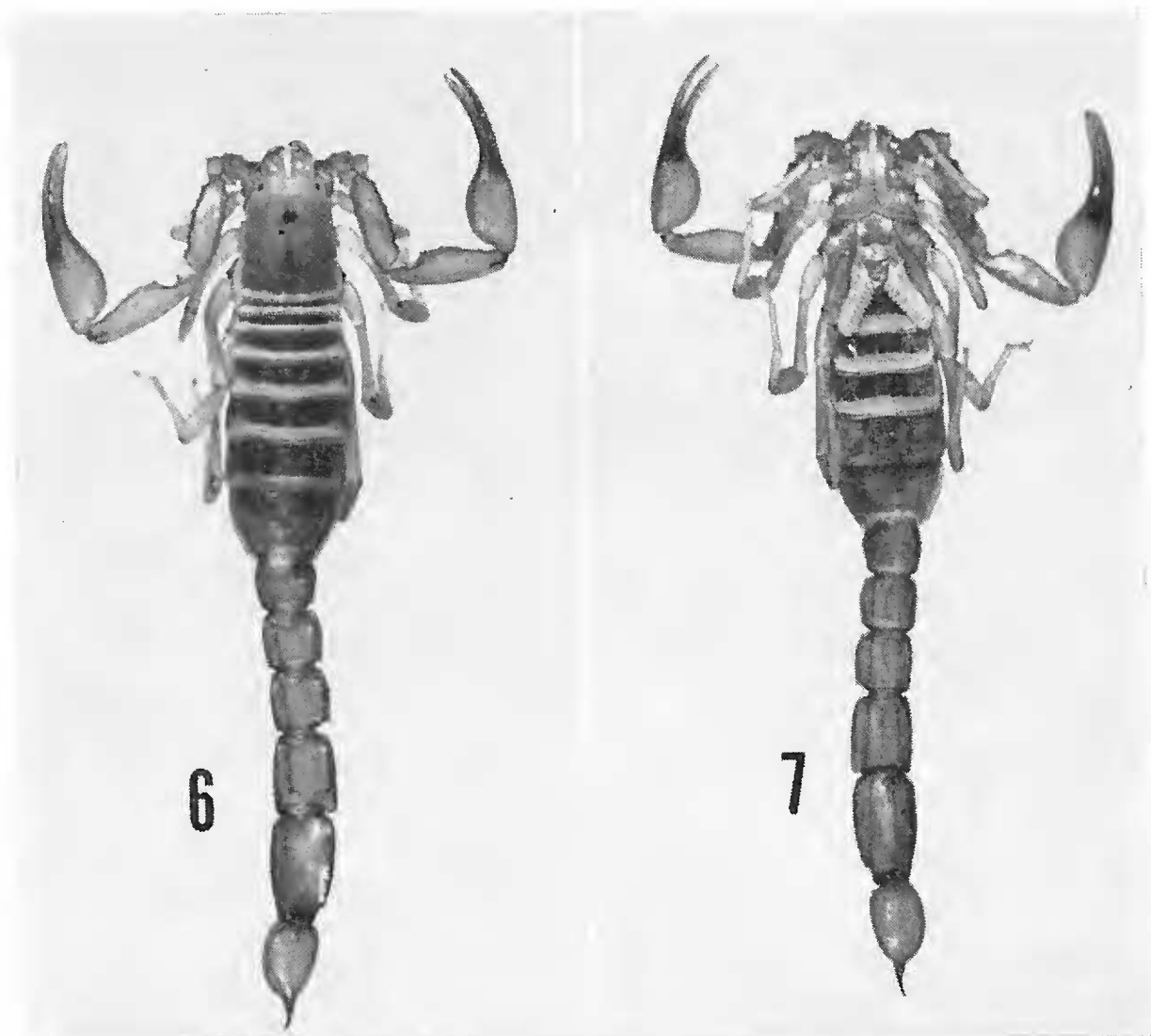
*Walking legs.*—Generally smooth; all keels very weak or obsolete. Conspicuous bristles sparse on all segments. Single row of short white bristles ventrally in line with unguicular spine along entire length of distal tarsomere.

*Genital plate.*—Completely fused medially.

*Pectines.*—Moderately hirsute; extending to trochanter of fourth walking leg; 11 teeth overlapping slightly in series; six oval to subcircular middle lamellae; fulcræ subcircular.

*Mesosoma.*—Terga extremely finely granular; vestigial median keel on terga four to seven; two pairs of weak lateral keels on seven. Sterna smooth to extremely finely granular; lateral keels on last sternum weak, granular; stigmata short, slit-like.

*Metasoma.*—Segments I-II wider than long, III about as wide as long. Keels: dorsals serrate, terminating in enlarged conical spine; superior laterals I-IV serrate, with enlarged spine on I-III and fin-like process posteriorly on IV, low



FIGS. 6-7. *Vaejovis spicatus* Haradon, new species. Holotype female. 6. Dorsal view. 7. Ventral view.

rounded granules on V; laterals granular in posterior  $\frac{1}{2}$  on I-II, posterior  $\frac{2}{5}$  on III, absent on IV, weak with scattered rounded granules in anterior  $\frac{3}{4}$  on V. Inferior laterals similar to corresponding inferior medians; I weakly crenulate; II crenulate; III crenulate to finely serrate; IV-V serrate. Inferior median keels I-IV set with 3, 3, 3, 3 bristles; dorsal keels with 0, 1, 1, 2 bristles.

*Telson*.—Vesicle laterally swollen; surface extremely finely granular; 16 long slender hairs on ventral and lateral surfaces. Aculeus short, sharply curved, with elongate subaculear protuberance (Figs. 4, 5).

*Variation*.—The only other adult specimen, also a female, does not differ significantly from the description of the holotype. Three minute immature specimens, of undetermined instar, were characterized most obviously by differences in anatomical proportions, lack of pigmentation, and incomplete carinal development; the subaculear tooth was well developed.

*MATERIAL*.—Holotype from Berdoo Canyon, 6.9 miles NE of junction with Dillon Road, Little San Bernadino Mountains, Riverside County, California (elevation 3600 feet), 31 March 1972, R. M. Haradon and J. L. Marks. Four paratypes from Berdoo Canyon, 3.2 to 5 miles NE of Dillon Road (elevation 2000-2500 feet), 18

TABLE 1. Measurements (in millimeters) of adult *Vaejovis spicatus* Haradon, new species.

	Holotype (female)	Paratype (female)
Total length	17.30	16.10
Carapace length	2.35	2.25
Anterior width	1.15	1.10
Width at/of ocular tubercle	1.65/0.25	1.60/0.25
Posterior width	2.00	1.85
Mesosoma length (sum)	6.10	5.65
Metasoma length (sum)	6.60	6.05
segment I length/width	0.90/1.15	0.80/1.10
segment II length/width	1.05/1.15	0.95/1.10
segment III length/width	1.15/1.15	1.05/1.10
segment IV length/width	1.35/1.25	1.25/1.20
segment V length/width	2.15/1.30	2.00/1.20
Telson length	2.25	2.15
Vesicle length/width	1.65/1.05	1.60/1.15
Vesicle depth	0.80	0.80
Aculeus length	0.60	0.55
Pedipalp humerus length/width	2.00/0.60	1.90/0.55
brachium length/width	2.30/0.70	2.15/0.65
manus length/width	1.85/1.00	1.80/1.00
chelal/fixed digit lengths	3.65/1.80	3.50/1.70
movable digit length	2.20	2.10
Pectinal teeth (left/right)	11/11	10/11
Middle lamellae (left/right)	6/6	6/6
Margin lengths, anterior/dentate	1.35/1.10	1.25/1.00

March, 9 April and 5 May 1972, and 24 February 1973, R. M. Haradon and J. L. Marks.

The holotype has been deposited at the California Academy of Sciences, San Francisco.

REMARKS.—The type locality and only known habitat is a narrow, sparsely vegetated, desert canyon. All specimens of *V. spicatus* were found on rocky canyon walls, by ultraviolet light at night. Also at the type locality occur at least six other scorpion species: *Hadrurus arizonensis* Ewing, *Paruroctonus vachoni* Stahnke, *Vaejovis confusus* Stahnke, *Vaejovis deserticola* Williams, *Vaejovis joshuaensis* Sologlad, and *Vaejovis hirsuticauda* Banks.

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sity, San Francisco, kindly reviewed the original manuscript. Photographic credit is due R. H. Howard, Los Angeles. Joseph L. Marks, Santa Monica, generously contributed much time and effort in the field, and is properly credited as the co-discoverer of *V. spicatus*.

#### LITERATURE CITED

SOLEGLAD, M. E. 1972. Two new scorpions of the wupatkiensis group of the genus *Vejovis*. *Wasmann J. Biol.*, 30: 179-195.

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#### BOOK NOTICE

EASTERN FOREST INSECTS. Whiteford L. Baker. U.S. Department of Agriculture, Forest Service, Miscellaneous Publications no. 1174, 642 pp. 1972. \$5.00.

This completely revised version of an earlier edition (For. Ser. Misc. Publ. 657) contains concise but informative accounts of the life histories of the important insects destructive to forest trees in eastern North America. The text has been extensively rewritten and many new photographs included. The cited literature includes over 800 entries, nearly all more recent than 1940, and both the insects and their host plants are indexed, which should make this volume an extremely valuable successor to the earlier work.—EDITOR.

#### RECENT LITERATURE

ANTS OF DEEP CANYON. George C. Wheeler and Jeanette Wheeler. Philip L. Boyd Deep Canyon Desert Research Center, University of California, Riverside. 162 pp. 1973. \$3.95.

In this paperback volume the Wheelers have produced a highly interesting summary of the biology of desert ants as well as a useful taxonomic treatment of the genera which occur in the arid regions of North America. Discussions of the ecological characteristics of the North American hot deserts and some of the morphological, physiological and behavioral adaptations of desert ants are followed by detailed taxonomic and ecological discussions of the species occurring in Deep Canyon. The text is profusely illustrated with photographs of the ants, their nests, and typical habitats, and provided with a glossary of technical terms.—EDITOR.